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# **Positive Train Control Technology & Regulatory Oversight**

**NTSB Hearing  
February 26, 2013  
Washington, DC**

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# Background

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- In 1994, FRA filed a required report with the Congress on Railroad Communications and Train Control. (Coined the term PTC.)
  - In 2000, FRA filed a required report with the Congress on Implementation of Positive Train Control Systems. (Based on RSAC report.)
  - In 2004, FRA filed a required report with the Appropriations Committees of the Congress on the Benefits and Costs of PTC.
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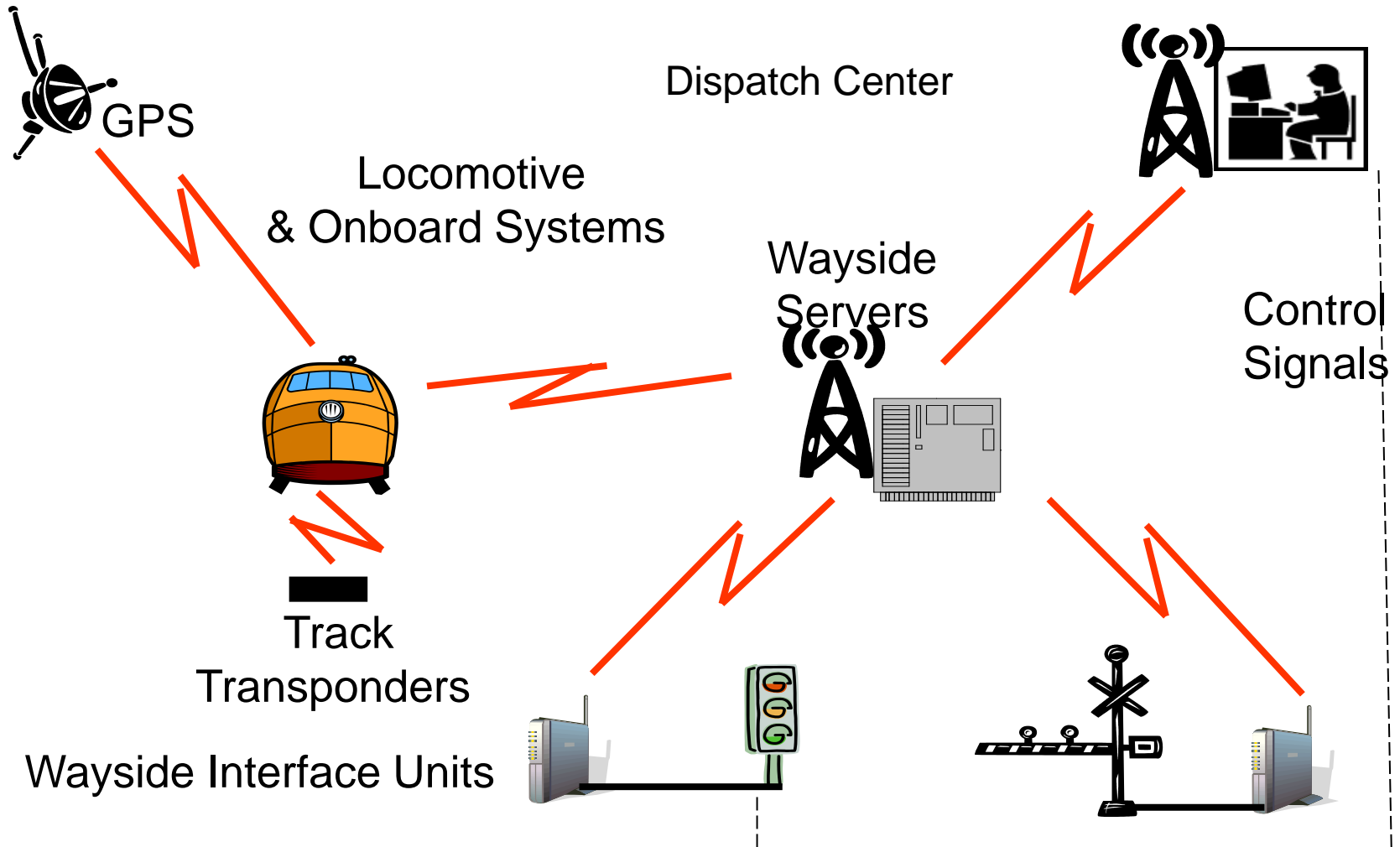


# Background

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- All three congressional reports noted the promise of PTC.
- All three congressional reports said the safety benefits of PTC could not support its costs.
- All three congressional reports pointed to the potential for other benefits, but noted that achieving them would require the railroads to integrate the technology into their business plans.
- Three Administrations; three reports; one message.

# Basic Architecture



- Vital & Non Vital
  - Vital
    - ✓ Guaranteed to Fail to Safe State
    - ✓ Crew Reliance Allowable
  - Non-Vital:
    - ✓ NOT Guaranteed to Fail to Safe State
    - ✓ Crew Reliance NOT Allowable
- Overlay & Standalone
  - Overlay: Existing Method of Operations Remains
  - Standalone: Replaces Existing Methods of Operation



# PTC Systems



## **Vital:**

System is both reliable and built on failsafe principals.

## **Non Vital:**

System is reliable but not necessarily built on fail safe principals.

## **Overlay:**

System works in conjunction with an existing signal system or a redundant method of operation.

## **Standalone:**

System replaces an existing signal system or method of operation.



# Advantages of PTC



- Enforcement Of Civil And Temporary Speed
- Full Enforcement To Zero Speed Before A Stop Signal Vice After Stop Signal
- Full Enforcement To Zero Speed Before A Misaligned Switch Vice Reduced Speed Through Switch.
- EIC Has Positive Control Of Train And Work Zone
- Does Not Require Track Circuits
- Greater Flexibility To Support Changes In Operations



# Limitations of PTC



- Will Not Prevent All Possible Train Accidents
  - Low Speed Collisions From Permissive Block Operation
  - Shoving Accidents In Reverse
  - Track Or Train Defect Derailments
  - Grade Crossing Collisions
  - Track Incursion Collisions
  
- Only Work Where Installed
  - All Trains Equipped (PTC)
  - Not Cutout



# Chronology

Action	Date
RSIA signed into law	October 16, 2008
RSAC development of NPRM	January-April 2, 2009
NPRM published	July 21, 2009
Public hearing	August 13, 2009
Comment period closed	August 20, 2009
RSAC review of comments	August 31-September 2, 2009
Final rule officially received at OMB	October 23, 2009
Final rule cleared OMB	December 30, 2009
Final rule signed	December 30, 2009
Final rule placed on public display	January 12, 2010
Final rule published	January 15, 2010
Comments on issue resolution due	February 15, 2010



# Chronology (2)

Action	Date
Final rule effective	March 16, 2010
Final Rule Amendment- Response to Request for Comments Effective	November 26, 2010
NPRM Amendment - Qualifying test removal	August 24, 2011
Final Rule Modification Qualifying test removal effective	July 13, 2012
NPRM Amendment Issued- de Minims & En-route Failures	Comment Close March 11,2013



# Chronology (2)



Action	Date
Final rule effective	March 16, 2010
PTC Implementation Plans due	April 16, 2010
FRA to respond to PTCIPs	July 16, 2010
PTC Safety Plans filed and reviewed	As ready under PTCIP schedules
PTC build-out (onboard and wayside)	Per PTCIP timetables
Risk Reduction Plans filed (with further PTC lines identified)	TBD 2012-2013
Progress report to the Congress	December 31, 2012
Initial PTC implementation complete	December 31, 2015



# Regulatory Submissions



## ✓ PTC Implementation Plan

- Deployment based Highest Safety Risk and Least Complexity
- Schedule- RR Working to Plans
- Technology to be used ( PTC Development Plan or Notice of product Intent)

## ✓ PTC Development Plan

- Common Product Information
- Architecture
- Detailed Concept of operations
- Target Safety Goals
- Performance Objectives



## ✓ Type Approval

- Eliminate Repetitive Paperwork
- Multiple Railroads Use
- File Once

## ✓ PTC Safety Plan

- Railroad Specific Information
- Safety Case
- Operations and Maintenance
- Testing
- Security



## ✓ Certification

- 4 Core Functions
- Interoperable



# Implementation Plans



- ✓ 43 Received
  - 42 Approved
  - 1 Review (New Start)
- ✓ Redacted IP Versions & Approval Letters available @ <http://regulations.gov>
- ✓ Next Step
  - ✓ RR implement per plan
  - ✓ RR update for approval as required
  - ✓ FRA Required Annual Report to Congress on Progress (December 2012 Report Moved to March 2012 timeframe)



# Development Plans, Type Approval & Certification



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- ✓ ACSES 2- Type Approved & Certified
  - ✓ ETMS Version 6 – Type Approved and certified
  - ✓ IETMS – Type Approved
  - ✓ FRA Working with submitting railroads
    - Address Technical concerns
    - Ensure TA understandable / TA User “Commitment”
  - ✓ Railroads elect choice of technology
    - Business Model
    - Degree of Aversion to Risk
    - Costs
    - “Compatibility of Installed Equipment
    - Subject to RR Interchange Agreements
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# Additional Information and Questions

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## 49 CFR 236 Subpart I

<http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&sid=7b1fa0f0e6b494746070b6af6096d35b&rqn=div6&view=text&node=49:4.1.1.1.30.9&idno=49>

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